

AMENDMENTS TO THE CLAIMS

1-26. (Cancel)

27. (New) An apparatus for achieving a desired dose distribution comprising:
image obtaining means arranged to obtain at least one treatment planning image from a patient to determine the relative location of target and sensitive structures;
treatment preparation means arranged to prepare a treatment plan for the patient based on the at least one treatment planning image, the treatment plan including a planned dose distribution;
image obtaining means arranged to obtain at least one image from the patient in substantially a treatment position, the image being adequate for dose calculations; and
adjustment means arranged to adjust how the dose is received by the patient.

28. (New) The apparatus of claim 27 further comprising dose distribution means configured to generate a planned dose distribution for the patient based on the treatment plan.

29. (New) The apparatus of claim 27 further comprising dose distribution repositioning means arranged to reposition the dose distribution for the patient based on the at least one image of the patient acquired at the time of treatment delivery.

30. (New) The apparatus of claim 27 further comprising treatment modification means configured to modify the treatment plan and the dose distribution.

31. (New) The apparatus of claim 27 further comprising patient position adjustment means configured to adjust patient position to better position patient's internal anatomy relative to the dose distribution.

32. (New) The apparatus of claim 28, wherein the dose distribution means generates a dose distribution based on the at least one image acquired from the patient at the time of treatment delivery.

33. (New) The apparatus of claim 27, wherein the dose distribution is modified to take into account changes in patient position and/or changes in patient anatomy.

34. (New) The apparatus of claim 27, further comprising plan selection means for selecting a treatment plan from a plurality of preexisting plans for the patient based on the image acquired from the patient at the time of treatment delivery.
35. (New) The apparatus of claim 34, wherein multiple plans created with objective functions are used for treatment delivery.
36. (New) The apparatus of claim 27, wherein objective functions and weightings are adjusted to fine-tune treatment delivery.
37. (New) The apparatus of claim 27, wherein objective function weights are learned by the apparatus based upon user training.
38. (New) The apparatus of claim 27, wherein results are utilized either by moving the patient, modifying the delivery, or some combination of the two.
39. (New) The apparatus of claim 27, further comprising contour means for generating contours by one of manual contouring, automated contouring, deformable fusion, template-based automatic contouring, and a combination thereof.
40. (New) The apparatus of claim 27, wherein the adjustment means repositions the patient to improve the dose distribution.
41. (New) The apparatus of claim 27, wherein the image obtaining means includes one of non-quantitative CT, MRI, PET, SPECT, ultrasound, transmission imaging, fluoroscopy, and RF-based localization.
42. (New) The apparatus of claim 38, wherein the treatment plan includes initially available images and related treatment plans and images obtained subsequent to initial planning.
43. (New) The apparatus of claim 27, wherein the adjustment means utilizes one of image information, contour information, dose-volume histograms, and dosimetric information to reposition the patient.